



PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Kenichiro Sato et al.

Appln. No.: 09/541,597

Group Art Unit: 1752

Filed: April 3, 2000

Examiner: R. ASHTON

For: **POSITIVE PHOTORESIST COMPOSITION FOR FAR ULTRAVIOLET EXPOSURE**

DECLARATION UNDER 37 C.F.R. §1.132

Commissioner for Patents
Alexandria, Virginia 22313-1450

Sir:

I, Kenichiro Sato, do declare and state as follows:

I am a citizen of Japan.

I graduated from Osaka University, Faculty of Engineering, Course of Applied Fine Chemistry in March 1992.

Since April 1992, I have been employed by Fuji Photo Film Co., Ltd., wherein I have been engaged in research and development in the technology of photoresist materials for semiconductors.

I am a co-inventor of the invention described and claimed in the above-named application, and I am familiar with the subject matter disclosed by the application.

In order to demonstrate the unexpected superiority of the present invention, the following experimentation was conducted by me or under my supervision.

COMPARATIVE EXPERIMENTATION

The photoresist composition solutions were prepared as set forth in the examples of the specification, page 129, except that the ingredients shown in Table 1 below were used.

The examples and comparative examples shown in Table 1 were prepared with photoresist compositions containing three components, i.e., a resin, a photo-acid generator and a surfactant, according to claims 4 to 8 of the present application.

Each symbol set forth in Table 1 was corresponding to that used in the present specification. The resins used were those set forth in Examples 56 and 58 in Goodall et al (they were within the scope of the present invention.) and the one set forth in Example 60 in the same patent (it was outside the scope of the present invention.).

By way of precaution, Examples b and g, and Comparative Examples 1 and 2 shown in Table 1 were same Examples b and g, and Comparative Examples 1 and 2 already indicated in the previous Sato's declaration.

Table 1

	Resin	Photo-acid Generator	Surfactant	Number of Development Defects	Defocus Latitude Depend on Line Pitch	Particle (Initial Value)
Example b	Example 56*	1	W-2	65	0.5	43
Example C	Example 56*	1	W-1	78	0.4	46
Example D	Example 56*	1	W-3	74	0.4	42
Example g	Example 58**	1	W-2	58	0.5	39
Example E	Example 58**	1	W-1	67	0.5	39
Example F	Example 58**	1	W-3	49	0.5	38
Comparative Example 1	Example 60***	1	W-2	2490	No Image Formed	380
Comparative Example E'	Example 60***	1	W-1	2190	No Image Formed	394
Comparative Example F'	Example 60***	1	W-3	2970	No Image Formed	364
Comparative Example 2	Example 60***	1	None	32970	No Image Formed	19260

: "56" means a compound synthesized in Example 56 of Goodall et al.

: "58" means a compound synthesized in Example 58 of Goodall et al.

: "60" means a compound synthesized in Example 60 of Goodall et al.

As is apparent from the comparison of Examples C and E with Comparative Example E', and the comparison of Examples D and F with Comparative Example F', the Comparative Examples, wherein the resin which is outside the scope of the present invention is included even though the specified surfactant which is within the scope of the present invention is included, fail in forming satisfactory images, and cannot achieve an excellent effect similar to that of the present invention as for the number of development defects as well as the defocus latitude depended on line pitch (meanwhile, Comparative Examples b' and g' wherein no surfactant is incorporated though the resin of the present invention is incorporated, are included in the data of the comparison experiment in the previous Sato's declaration which was already submitted).

Therefore, the present invention achieves particularly preferable and unexpected effects on the number of development defects and DOF pitch dependency by the combination of a specified resin with a specified surfactant.

As is apparent from the order of the particle (initial value), the compositions of the present application show small particle numbers from immediately after preparation, providing another advantage.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: Apr. 1, 2004

Name: Kenichiro Sato

Kenichiro Sato